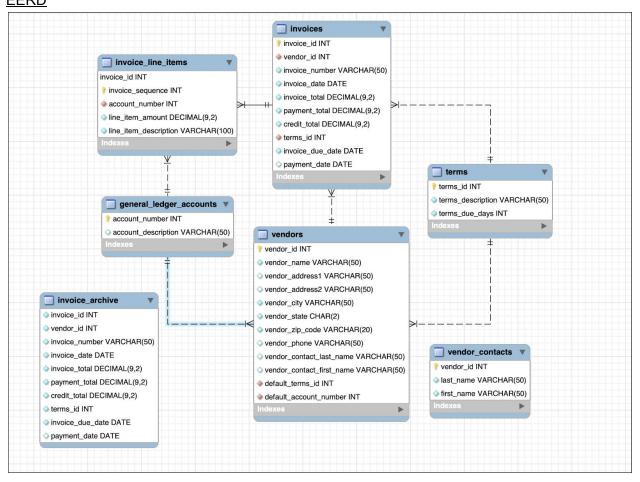
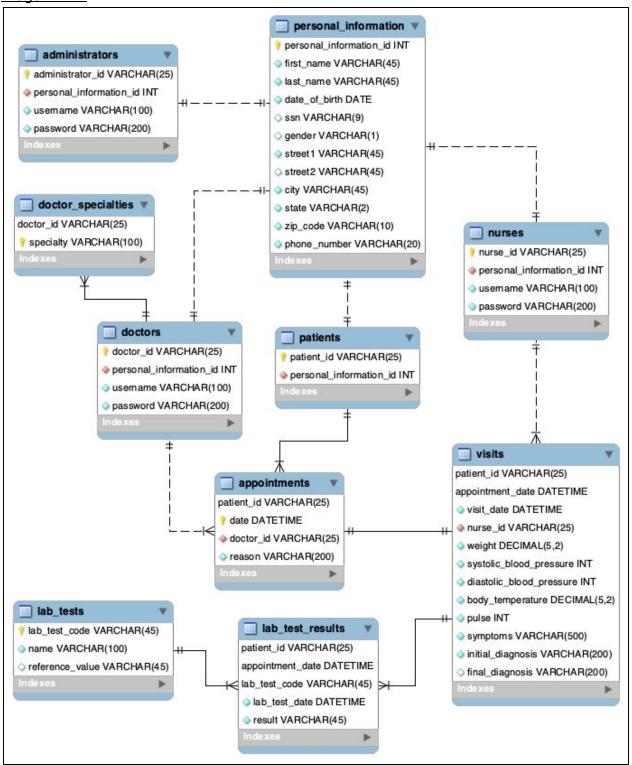
## ALONSO AYALA ORTEGA

## Part I EERD



Part II image-EERD



END IF;

## Referential integrity with surrogate keys

```
personal_information (personal_information_id, first_name, ...)
 administrators (administrator_id, personal_information_id, userpame, password)
 doctor_specialties (doctor_id, specialty)
 doctors (doctor_id, personal_information_id, username, password)
 patients (patient_id, personal_information_id)
 nurses (nurse_id, personal_information_id, username, password)
 appointments (appointment_id, patient_id, date, doctor_id, reason)
                                           unique(patient_id, date)
 visits (visit_id, appointment_id, visit_date, nurse_id, weight, systolic_blood_pressure, ...)
                                                                   unique(appointment_id)
 lab_test_results (visit_id, lab_test_code, lab_test_date, result)
 lab_tests (lab_test_code, name, reference_value)
Part III
Stored Procedure
USE clinic_management;
DROP PROCEDURE IF EXISTS getMostPerformedTestsDuringDates;
DROP FUNCTION IF EXISTS getLabTestResultTypeCount;
DROP FUNCTION IF EXISTS getLabTestCountByPatientAgeRange;
DELIMITER $
CREATE FUNCTION getLabTestResultTypeCount(lab_test_code_param VARCHAR(25), result_type
VARCHAR(45))
RETURNS INT
READS SOL DATA
BEGIN
 DECLARE lab_test_count INT;
 IF lab_test_code_param IS NULL OR result_type IS NULL THEN
  SIGNAL SQLSTATE 'HY000'
  SET MESSAGE_TEXT = 'You must specify both the lab_test_code_param and the result_type.',
MYSQL_ERRNO = 1108;
```

```
SELECT COUNT(*) INTO lab_test_count
FROM lab_test_results
WHERE lab_test_code = lab_test_code_param
 AND result = result_type;
RETURN lab_test_count;
END$
CREATE FUNCTION getLabTestCountByPatientAgeRange(lab_test_code_param VARCHAR(25),
start_age INT, end_age INT)
RETURNS INT
READS SOL DATA
BEGIN
DECLARE lab_test_count INT;
 IF lab_test_code_param IS NULL OR start_age IS NULL OR end_age IS NULL THEN
 SIGNAL SQLSTATE 'HY000'
  SET MESSAGE_TEXT = 'You must specify the lab_test_code_param, start_age, and end_age.',
MYSQL_ERRNO = 1108;
 END IF:
 IF start_age > end_age THEN
 SIGNAL SQLSTATE 'HY000'
  SET MESSAGE_TEXT = 'end_age must be greater or equal than start_age.', MYSQL_ERRNO =
1108;
END IF;
 SELECT COUNT(lab_test_code) INTO lab_test_count
 FROM lab_test_results
 INNER JOIN patients USING (patient_id)
 INNER JOIN personal_information USING (personal_information_id)
WHERE lab_test_code = lab_test_code_param
 AND TRUNCATE(DATEDIFF(lab_test_date, personal_information.date_of_birth) / 365.25, 0)
BETWEEN start_age AND end_age;
RETURN lab_test_count;
ENDS
CREATE PROCEDURE getMostPerformedTestsDuringDates(IN startdate DATE, IN endate DATE)
BEGIN
 DECLARE all_tests_count INT;
 IF startdate IS NULL OR endate IS NULL THEN
```

```
SIGNAL SQLSTATE 'HY000'
 SET MESSAGE_TEXT = 'You must specify a startdate and endate.', MYSQL_ERRNO = 1108;
 END IF:
 IF startdate > endate THEN
  SIGNAL SOLSTATE 'HY000'
 SET MESSAGE_TEXT = 'endate must be greater or equal than startdate.', MYSQL_ERRNO =
1108;
 END IF;
SELECT COUNT(lab_test_code) INTO all_tests_count
 FROM lab_test_results
WHERE lab_test_date BETWEEN startdate AND endate;
SELECT
 t.lab_test_code,
  t.name.
 COUNT(t.lab_test_code) AS tests_count,
  all_tests_count,
 COUNT(t.lab_test_code) / all_tests_count AS test_count_percentage,
  getLabTestResultTypeCount(r.lab_test_code, 'normal') AS normal_results_count,
  getLabTestResultTypeCount(r.lab_test_code, 'abnormal') AS abnormal_results_count,
  getLabTestCountByPatientAgeRange(r.lab_test_code, 18, 29) / COUNT(t.lab_test_code) AS
tests_on_18_29_pecent,
  getLabTestCountByPatientAgeRange(r.lab_test_code, 30, 39) / COUNT(t.lab_test_code) AS
tests_on_30_39_pecent
  FROM lab_test_results r
   INNER JOIN lab_tests t USING (lab_test_code)
 WHERE r.lab_test_date BETWEEN startdate AND endate
 GROUP BY t.lab_test_code, t.name
 HAVING tests_count > 1
 ORDER BY tests_count DESC, t.lab_test_code DESC;
END$
DELIMITER ;
```